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The Honey Badger in South Africa: Biology and Conservation

Abstract

The honey badger (*Mellivora capensis*) is an intriguing animal with very particular behavioral characteristics, however, but the knowledge of this, “the most fearless animal in the world”, is incomprehensive. In the following review, we have focused on its behaviour and status in South Africa. Considering that there have been several problems in sustaining the population, mainly related to ongoing threats from agriculture, we have outlined the aspects of the honey badger biology relevant for implementing optimal conservation efforts. Consequently, the conservation status and strategies have been described and discussed, using the available but limited literature. We concluded that the present conservation efforts and solutions have been successfully implemented in South Africa, the badger-friendly products are now a reality and readily available in South Africa. However, the long-lasting effect of present conservation strategies on the honey badger sustainability needs to be evaluated in the future. The conservations measures carried out in South Africa can be a good example for preserving the population globally.

Keywords: Honey badger, nutrition, reproduction, behaviour, beekeepers, conservation

Research Article

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Introduction

The honey badger (*Mellivora capensis*), also called ratel, and are an interesting animal as there are many myths surrounding its nature and behaviour. It is well known as a fearless creature that can be quite aggressive when threatened [1]. Little research has been done on the honey badger as it is a difficult test subject due to its solitary and shy nature. Furthermore, there is no explicit information about the present population of the honey badger in South Africa. Thus, conservation strategies are difficult to implement, as information on their population statistics in the wild is not documented and their behavioral patterns and social structure are not well known or understood. Although according to IUCN Red List [2] it has been listed as Least Concern, they are several anxieties about sustainability of the populations mainly related to conflicts with agriculture sector (particularly with beekeepers) but also concerning killing animals for traditional medicine and indiscriminate poisoning. With these problems in mind, we have outlined important aspects of honey badger biology which are relevant for better understanding the animal behaviour and its impact on conservation strategies. Consequently, the conservation status and strategies in South Africa are described and discussed.

Biology

The honey badger is classified under the Mustelidae family, subfamily Mellivorinae. They have long cylindrical bodies, approximately 60-77cm in length, combined with short legs. Each paw has five toes, with the hind legs having shorter claws than the forelegs; this assists with digging and climbing. They stand approximately 25-30cm high at the shoulder [3] Their skin is loose

and tough; this allows the animal to twist and work its way free from either an attacker or from being stuck in a tight space, whilst also providing protection from bites inflicted by other carnivores [4]. They have two large scent glands, which are located in the anus, and assumed to play a role in territorial marking and act as a defense mechanism when threatened [5]. Honey badgers are predominantly nocturnal but have been observed to switch to diurnal activity during the cold-dry months. They are solitary animals, but a female and her cub can be seen foraging together and they can hunt in pairs during the mating season [6].

The honey badger lives in Iran, western Asia, and the Indian peninsula, Morocco, Algeria, sub-Saharan Africa and South Africa. It inhabits various types of biomes; forests, deserts and mountainous areas [7]. In South Africa is widely distributed, except the north-west coastal areas. The home range of the honey badger varies with gender, with the females, influenced by food source availability and the males by the frequency of receptive females within a specific range. Females utilize an extensive home range due to limited food resources and long cub dependency, following a seasonal pattern of movement in response to seasonal food supply. Females do not actively defend a territory, nor do they commonly interact with each other, but they do depict loosely territorial behaviour, such as urinating in areas where they forage. Males have a much larger home range than females, often overlapping with female home ranges, indicating an inter-sexual territory.

These animals are highly polygynous and have a relatively promiscuous mating system, with males maximizing the breeding frequency by overlapping their movement ranges and moving faster than female counterparts. A male honey badger can

encompass a home range of at least 13 females; thus, they are said to have a roaming rather than staying migration behaviour. Upon finding a receptive female, they will often compete for her at a mating burrow, with the interactions influenced by scent-making and their hierarchical social structure between sexually mature males. One difference that should be noted is that prior to reaching sexual maturity, younger males will, unlike adult males, be first influenced by food source availability and then by the frequency of receptive females.

Honey badgers are opportunistic hunters; thus they will opt for more readily available food resources, causing a seasonal variation in their diet. Small mammals form the major part of the diet, but small reptiles and scorpions are also eaten when small mammals are less abundant. It is often reported that honey badgers are omnivorous, but a study conducted by Begg (2006), at the Kgalagadi Transfrontier Park, South Africa, showed that they are mainly carnivorous but resort to eating fruits such as tsamma melons for their moisture content when environmental conditions are harsh and water sources scarce. The main diet of the honey badger consists of invertebrates and small vertebrates.

The honey badger forages for food alone, with smell being the key sense utilized to locate prey; they will search for the food every day regardless of the prey source caught the previous day. While foraging, a winding walk can be observed while it searches burrows, follows a scent trail and occasionally lifts its nose into the air to smell, after which an adjustment in the direction towards the trail of a scent can be seen. Begg (2006) noted that male honey badgers also have a faster-paced trot when they are busy with social activities, namely visiting previously marked spots, scent marking (primary scent-marking behaviors are anal drag, squat mark, token urination, defecation and squat urination, while secondary scent-marking behaviors are body-neck rubbing and scratching and rolling) or looking for receptive females. Upon locating a potential mate, both females and males utilize their well-developed frontal claws for digging, which is the preferred method of hunting for females, while the males are more willing to climb to raid nests and beehives or climb and rip off bark to catch lizards and skinks. The honey badger is a skilled hunter, sometimes barricading an entrance to a burrow with its forepaws and digging at another entrance to the same burrow with its hind paws, chasing the animal within the burrow towards their waiting paws. The honey badger is well known for its endurance and is slow to tire; as a result, it can often target larger prey, through a strategy of exhaustion, weakening the larger animals [8]. In a study by Begg (2006), this hunting mechanism was observed, where a female badger chased a springhare (*Pedetes capensis*) until it took refuge in a burrow, where the honey badger found and killed it. The same method has also been used as a fighting for survival tactic, with larger rivals such as cheetahs and even lions. They are not scavengers but on the rare occasion it has been reported [9].

The age of sexual maturity for either gender is not known but it is suspected to be 2-3 years old for males and 12-16 months for females, thus indicating that males are not sexually mature upon independence, unlike that of females. The female honey badger is polyandrous, so will mate with multiple males in the period when she is receptive, which lasts for approximately two weeks;

however, unlike other species, she does not mate each year, despite having a short gestation period. The gestation period of the badger is approximately 50-70 days, with typically one cub born, remaining with the mother for a period of 12-16 months. The honey badger can mate at any time during the year, thus they are not seasonal breeders; however, they do show a preference for mating during the hot dry or wet seasons.

With regard to the parental nature of these animals, they are uniparental, with the female taking sole responsibility of the cub. The cubs, known as "den cubs", do not leave the den unless carried by the mother for a period of 3 months. Research in southern Kalahari showed that cubs stay with mothers, approximately 12-16 months, developing hunting, climbing and digging skills (Begg 2006). The cub will leave the mother upon developing sufficient skills to be proficient enough to hunt and survive on its own, as a result of suitable mates being close or due to the arrival of a new cub. This period of independence is a critical period for the cub, with mortality rates of approximately 47% as a result of starvation or predation. The combination of a single offspring, late sexual maturity and long birthing interval affects population propagation and survival and has special significance in terms of the success of conservation programmers (Begg, 2006).

Conservation

Conservation status

Trying to assess and quantify the current status of honey badger populations and whether there is a cause for concern is extremely difficult due to their wide habitat range, continual movement and solitary and secretive nature. An additional cause for concern is the differing perception of the viability of honey badger populations in South Africa, with specific reference to Western Cape. It is the perception of beekeepers that honey badgers are in a state of overpopulation, whereas conservationists see their population numbers as a cause for concern [10].

The International Union for Conservation of Nature - IUCN is an organization that documents and tracks the loss of biodiversity for animal species - Red Data Book of South African Mammals [11]. Besides, this organization guides governments and conservation programmers with regard to implementing conservation strategies. The listing for the honey badger, according to the Red Data Book of South African Mammals, is that of near threatened as of 2002 and is a schedule 2 protected wild animal. However, as of the 2015 assessment of the conservation status of the honey badger, by the IUCN Red List, it has been listed as of least concern. This listing status has been justified due to the honey badgers' wide distribution and the lack of data indicating the population's decline. The conflict of opinion on the conservation status of the honey badger makes garnering support for efforts towards conserving their population numbers extremely difficult.

In addition, the lack of impact from mitigation steps already in place is cause for concern and perhaps revision. For example, although the honey badger is registered as a protected species in South Africa, the lack of legislation enforcement from the government; their low level of prolificacy and long generation intervals, coupled with their persecution has allowed for a continuance of honey badger population declines [12,13].

Conservation concerns

In South Africa, the major threat to honey badgers has been beekeepers. The average production of honey in South Africa is approximately 2000 tonnes per annum (Green Choice). The annual benefits from selling honey and other bee products were estimated to about 12 million US dollars, however, for the country the main importance is the pollination for the fruit industry [14]. The conflict between beekeepers and honey badgers has been documented since the early 1800s. The conflict has arisen from the destruction of apiaries and economic loss, as a result of honey badgers raiding honey bee apiaries, as the need for commercial beekeeping intensified. This conflict has led to the persecution of honey badgers by beekeepers, with the resulting rapid population decline prior to 2001, as methods of control such as poison or gin traps are lethal; this is a cause for concern and has piqued the interest of conservationists.

Approximately one to two hundred badgers are killed by beekeepers each year in South Africa [15]. Honey badgers are considered a major predator of honey bees, causing losses of up to 7% of bee hives per season [16]. The action of the honey badger when raiding apiaries often leaves the hives destroyed, which only further increases the conflict with beekeepers. In a previous study by Begg, it was reported that about 80% of beekeepers in the Western Cape had experienced problems with honey badgers, with approximately 50% of them admitting to killing honey badgers. As stated, the control methods put in place are chosen for their cost effectiveness for that of beekeepers, with little thought about their impacts on badger populations or the environment as a whole. These methods are often indiscriminate and lethal; thus, the negative impacts of these “control measures” often affect non-targeted species. In addition to raiding apiaries, honey badgers are also widely blamed for depredations on small domestic stock, as they are carnivorous by nature [16]; furthermore, they are killed for traditional medicine and for use as protective charms or as charms for hunting dogs, which further increases their population decline [17].

Conservation plan of action

Conservation efforts are working towards a healthy relationship between beekeepers and honey badgers. Only 30% of National Parks and 28% of the Western Cape's Provincial Nature Reserves may currently support viable populations of honey badgers; thus, consideration for both the production efficiency and sustainability of honey production, combined with maintaining viable honey badger populations, should be a focus. In 2002, the Endangered Wildlife Trust established the Badger-Friendly initiative with the South African Bee Industry Organization (SABIO) [18] and The Wildlife and Environmental Society of South Africa which forms part of the Green Choice Alliance and works with producers and retailers to promote and support beekeepers producing “Honey Badger-Friendly” products. The initiative is based firstly on hive protection, as studies have shown that apiaries placed at ground level are particularly vulnerable to raiding. The honey badger-resistant beehives were developed and beekeepers have been encouraged to keep their beehives high above the ground and use resistant hives made of metal, which are cost effective and badger resistant. Secondly, the initiative informs and assists beekeepers

with the necessary channels to label and market their products as badger-friendly. Currently, over 320 beekeepers have subscribed to the South African Bee Industry Organization (SABIO) and produce badger-friendly products. A nationally recognized sticker and accreditation system were developed in cooperation with the bee industry. Beekeepers that sign a public declaration declaring their subscription to environmentally friendly and law-abiding beekeeping are allowed to display the “badger-friendly” logo on their products. A designated extension officer monitors and regulates registered beekeepers to ensure compliance with badger-friendly practices. The African Wildlife Foundation recommends programmes that foster conservation education and prevent human-wildlife conflicts, especially for communities living in close proximity to wildlife, to educate and broaden the understanding of people to the importance of conserving and maintaining the environment and the animals that form part of it (African Wildlife Foundation, NA) [19]. The honey industry is reporting improved sales for producers making badger-friendly products, thus maintaining the economic incentive to produce honey in a badger-friendly manner.

Conclusions

Conservation efforts can be achieved through education and the conscious effort of conservationists and beekeepers to source environmentally friendly and economically viable options of keeping bee apiaries safe; producing honey in a badger-friendly manner that causes no harm to the animals or population numbers. Conservation efforts and solutions have been successfully implemented and the honey badger is now a success story in terms of conservation, but the long-lasting effect on honey badger sustainability needs to be evaluated in the future. As a result of conservation efforts and cooperation from beekeepers, the badger friendly products are now readily available in South Africa. Efforts and products such as these should be supported and promoted in other countries, to ensure the safety and survival of this shy and little-known animal.

Conflict of Interest

The authors declare no conflict of interest.

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